

THE CITY OF SEATTLE
PURCHASING DEPARTMENT
4TH FLOOR 400 YESLER BLDG.
SEATTLE, WASHINGTON 98104

January 2, 1985

DATE OF INV

INVESTIGATION NO. 42672
XXXX RFP 42672

SEALED BIDS WILL BE RECEIVED BY THE BUYER AT
4TH FLOOR 400 YESLER BLDG.

UNTIL: TIME DATE
5:00 P.M. 02-08-85

WOULD BE SHIPPED TO:
THE CITY OF SEATTLE

ADDRESS CITY LIGHT

DEPT.

DELIVERY
ON OR BEFORE

SEE BELOW

BUYER

E.R. JONES:lmw

PHONE (206) 625-2255

THIS IS NOT AN ORDER - TERMS AND CONDITIONS APPEAR
REQUEST FOR BID FOR FURNISHING THE ITEM(S) LISTED BELOW ON REVERSE SIDE

These terms and conditions supersede any inconsistent provision in any other form, including an order, acknowledgment or invoice by Seller.
INSTRUCTIONS: (1) Submit bid as firm offer good for 90 days from date of receipt; (2) Use space below with unit prices on each item, attach pages if needed, initial a changes or erasures; (3) Make bid on terms and conditions on reverse side - bids on other forms are not responsive; (4) Quote prices F.O.B. destination; (5) Exclude FEDER EXCISE TAXES - Certificate of Registry No. 9173 0099K exempts City; (6) State bid EXCLUSIVE of federal, state or county sales taxes; and (7) Confine communications w City on prices and terms of sale to Purchasing Agent - Information received from other City agencies or officials is not binding.
QUALIFICATIONS: (a) The City reserves the right to reject any and all bids; (b) Ordinance 101432, § 3.3, limits City purchases to pre-qualified bidders. To pre-qualify, f data and documents with City's Director of Human Rights showing compliance with federal, state and local laws against discrimination; (c) Bidders must have a valid C Business License if located within Seattle or if this contract or all Bidder's contracts with the City in any year exceed \$50,000."

ITEM NO.	QUANT.	UNIT	STOCK NO.	DESCRIPTION	UNIT PRICE	TOTAL
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REQUEST FOR PROPOSAL

PCB Decontamination of Fuel Oil on-site at City Light Lake Union Steam Plant. Furnish all equipment, supplies and labor to incinerate or decontaminate the oil, document the results and remove all equipment and residual materials per the attached Request for Proposal - Attachment #1.

Related Documents:

Insurance "Addendum #1 to General Conditions" - Attachment #2

Affirmative Action Forms - Attachment #3

Aerial Photos and Facility Drawings #D11977, Rev. 4 and C4367 - Attachment #4

Total Firm Price \$6,325,800.00 for performing the above per the processes and schedules of the vendor proposal.

NOTES:

- 1) Schedule of Events - see RFP Page 19.
- 2) Performance Bond to be required from successful vendor - See RFP Page 4.
- 3) Insurance requirements for successful vendor see RFP Page 5 and Attachment #2.
- 4) Note the "Required Contents of Written Proposal" - RFP Page 11.
- 5) Other than questions submitted prior to the January 15, 1985 facility tour, vendors are not to make any contact with the City about this Request for Proposal except through the Office of the Purchasing Agent:

(CONT. PAGE TWO)

FIRM NAME PPM, INC. (Parts Per Million, Inc.)		DELIVERY SCHEDULE QUOTED August 1, 1985		CASH DISCOUNT TERMS (IF ANY)
ADDRESS 10 Central Avenue		DATE OF BID	TELEPHONE NO.	FIRMS WA STATE RETAIL SALES TAX NO.
CITY Kansas City, Kansas	STATE Kansas	ZIP 66118	BID BY X <i>Scott Burnett</i>	SIGNATURE General Manager

PLEASE SUBMIT BID ONLY IN ENVELOPE to be sealed & addressed: PROVIDED HEREWITH
CTY0069102

SEA315516

method will enable final clean-up of residual material via dilution in oil and thermal destruction.

As a second avenue to Thermal Destruction, Acurex is offering Alternate II, namely, Chhemical Destruction. This alternate will also provide all of the advantages Alternate I, but will be relatively expensive in comparison to Alternate I.

Of the two alternates, Acurex recommends implmenting Alternate I. We present below our approach in identifying the two proposed alternates. Discussions relevant to each alternate are also presented in the following paragraphs.

The key factors considered by Acurex in identifying the methods proposed for PCB destruction/decontamination are:

- The proposed method must address and meet the basic requirements of City Light's Goal Statement (Section II of the RFP)
- The proposed method must be:
 - Simple, practical, tested, and proven
 - Cost-effective
 - Able to satisfy all applicable Federal, State, and local environmental, and other laws, codes, and permit requirements
 - Safe and lowest risk to the community and the general environment
 - Able to complete the PCB cleanup in an expeditious manner

In both the alternates, Acurex proposes a phased approach consisting of three major steps which would ensure ability to satisfy the goals and the key factors outlined above. In each alternate, the three phases will include:

- Technical/engineering assessment and permitting
- Onsite trial/demonstration of the proposed alternate
- Onsite, full-scale application to implement PCB cleanup

Acurex firmly believes that for this sensitive project, there can be no substitute to a methodic and phased approach, since it will ensure cost effectiveness at minimal risk, and provide City Light and concerned citizens the ability to exercise appropriate evaluation and control at each phase.

Described below are the two alternate methods proposed by Acurex.

Alternate I -- Thermal Destruction of PCB's

Based on the current state of the technology, Federal regulations, and Acurex's experience, we believe that the most cost-effective and lowest overall risk option for the disposal of the PCB-contaminated fuel oil is cofiring the contaminated oil with regular fuel oil in one of the Lake Union Steam Plant boilers. This will destroy the PCB contamination while realizing the heat value of the contaminated oil in generating steam and electricity.

The U.S. Environmental Protection Agency specifies disposal requirements for PCB-contaminated liquids. Section 761.60, paragraph (a)(3) of Title 40 pertains to liquids other than mineral oil dielectric fluid containing a PCB concentration of between 50 and 500 ppm (i.e., the Seattle fuel oil) and subparagraph (iii) permits disposal in a high-efficiency boiler provided that specific performance criteria are met. Currently, there are 18 boiler units in operation in the United States which are permitted to cofire PCB-contaminated fluids. This disposal option is legally permissible and technically proven and feasible and, can be implemented at a significantly lower cost than other known options. Thus, Acurex Corporation believes that the City of Seattle should give full consideration to this approach.

The activities leading to the destruction of the PCB-contaminated fuel oil have been divided into three phases, namely, (1) technical/engineering assessment and regulatory permitting, (2) trial demonstration, and (3) full-scale PCB destruction via cofiring. During Phase I, the permitting process and requirements will be detailed, permit applications prepared, and regulatory approvals sought. The EPA-required informational items are listed in paragraph (a)(3)(iii)(B) of Section 761.60. Engineering design data for the proposed boiler to be used, chemical analysis results characterizing the contaminated fuel oil and proposed operating procedures would be documented for inclusion in the permit application. In addition to seeking regulatory approval for this disposal option, the LLLSP boilers would be evaluated with respect to their suitability for use to cofire the contaminated materials. Boiler design parameters and operating conditions would be reviewed. The most suitable boiler would then be selected and recommended for use. Any modifications necessary to the boiler, feed, and/or control systems would be itemized and costed. The cost of actually performing such modifications are, of course, not quantified in this proposal.

Another segment of the Phase I work activity will be to discuss this disposal option with concerned local governmental officials and citizen groups. Possible health effects as well as environmental risk issues would be reviewed. A qualified independent and respected expert in the public health sciences would be called upon to evaluate the applicable issues and present his findings to concerned agencies, individuals, and citizen's committee.

Phase II of this work effort involves performing a demonstration trial burn of the contaminated fuel oil in the selected boiler. Although not mandatory in the disposal requirements of Section 761.60, given the citizen concern for PCB's in the environment, such testing is recommended. The EPA

Regional Administrator will ultimately need to approve the PCB disposal plan and many also desire to see trial burn data. The objective of the trial burn would be to quantify the PCB destruction and removal efficiency (DRE).

Testing of the boiler flue gas would be performed using both fluorsil resin and XAD-2 resin in two separate resin traps contained in a single modified EPA Method 5 sampling train. Sampling would be conducted so as to quantitate at least 99.9999 percent DRE. Several different boiler operating conditions (probably less than three) may be maintained throughout the trial burn so that the effect of varying operating parameters on PCB DRE can be evaluated. Thus, allowing for three replicate test runs for each operating condition, up to nine test runs may be necessary. An estimated testing period of 2 weeks will be required. Concurrent to the flue gas PCB testing, emissions of CO, CO₂, and O₂ would be quantified using continuous emission monitors. In addition, samples of the fuel will be collected throughout the trial burn period. These samples will then be analyzed for PCB's, and the boiler input quantity calculated. The results of the trial burn field testing and subsequent laboratory analysis will be documented in a trial burn report. This report will be submitted to the Regional Administrator and interested agencies and individuals.

The disposal of the PCB-contaminated fuel oil would commence upon receipt of all regulatory agency approvals. This work (i.e., Phase III) would include the tasks necessary to ensure that the optimum PCB destruction conditions (determined in the trial burn test phase) were maintained. These activities involve exhaust gas CO and O₂ continuous monitoring, primary fuel, and contaminated fuel feed rate recording and maintaining specified operating conditions (e.g., CO < 50 ppm and O₂ at least 3 percent).

Table 1 outlines the activities within each of the three phases of Alternate I, Thermal Destruction, and shows respective estimated costs and schedules associated with each phase.

Alternate II -- PCB Destruction by Chemical Method

In the second alternate, Acurex proposes to use a chemical destruction process which Acurex has operated on a commercial scale for over 4 years and uses a mobile system that can be brought to the concerned site. This proven and established process has successfully destroyed PCB's in contaminated dielectric fluid (MODEF), heat transfer fluid (Dowtherm A and therminol T-66) and hydraulic fluid. However, destruction of PCB's in commercial quantities of residual No. 6 Oil has not been reported to date.

The properties of residual No. 6 Oil are similar to that of MODEF and hydraulic fuels. It may be possible to extrapolate that experience to No. 6 Oil. However, certain basic questions remain to be addressed in order to ensure first time success in destroying the PCB's in No. 6 Oil safely and effectively. One of the prime concerns is that of a reported problem of possible "gel" formation when No. 6 Oil is chemically treated. This would present significant problems in keeping the mass under treatment in a fluid condition thus rendering a treatment system inefficient or inoperable.

Table 1. Outline of Alternate I -- Thermal Destruction of PCB's

<u>Phase I Technical/Engineering Assessment and Permitting</u>	
<u>Subtasks</u>	
<u>Submit permit application</u>	
<ul style="list-style-type: none">● Gather data, review operating procedures (O_2/CO)● Meet with agency● Meet with city/plant officials● Prepare permit application● Perform fuel analysis	
<u>Technical/engineering assessment</u>	
<ul style="list-style-type: none">● Gather engineering data● Review data, perform calculations● Select boiler● Itemize modifications needed● Cost the required modifications● Pretest boiler (monitor CO and O_2 versus boiler output)	
<u>Information dissemination to citizens</u>	
<ul style="list-style-type: none">● Prepare presentation● Review by qualified expert● Presentation to concerned groups● Hire PR firm to provide information to the citizens	
Total estimate cost for Phase I	<u>\$50,000</u>
Estimated time for Completing Phase I	3 months

Table 1. Continued

Phase II Onsite Trial/Demonstration of Thermal Destruction

- Make necessary modifications to feed contaminated fuel oil to the boiler identified in phase I
- Complete all preparations such as scheduling labor, mobile emissions monitoring van, testing, and other equipment onsite
- Ensure all sampling and monitoring points are made safe and accessible
- Perform 10-day trial in which contaminated fuel oil is cofired with regular fuel oil in the selected boiler with continuous monitoring and associated sampling and analysis. The cofiring trial will be performed.

Total Estimated cost for phase II \$75,000

The cost does not include modifications for delivering contaminated fuel oil to the selected boiler. The modification cost can be estimated on completion of phase I, and it is projected that this cost will be minimal. The cost for phase 2 does not include labor and materials operating the City of Seattle Power Plant boiler but includes Acurex's material and labor for monitoring analysis and reporting.

Estimated time for performing trial burn 15 days

(Does not include time for installing modifications described above.)

Phase III Full-Scale Operation for Thermal Destruction

- After trial demonstration (Phase II), complete any minor modifications and refinements
- Cofire contaminated oil with regular fuel oil in the selected boiler in round-the-clock operation produce steam and electricity
- During above operation, perform round-the-clock monitoring, sampling, and analysis to ensure PCB destruction

Total Estimated cost for Phase III \$100,000

The cost does not include labor and materials to operate the boilers but includes labor and materials for monitoring sampling and analyses round-the-clock.

Estimated time for completing Phase III 3 months

Table 1. Concluded

<u>Summary -- Alternate I -- Thermal Destruction</u>	
Total estimated cost	<u>\$225,000</u>
Total estimated time for completion	6 months and 15 days

Again, in this alternate a phased approach of technical/engineering assessment, demonstration followed by full-scale treatment will be necessary to ensure successful and safe PCB destruction.

In the first phase, key factors will be addressed via an experimental process study followed by technical/engineering assessment. The factors are:

- Effects of Process Temperature. Determine and define the temperature range in which the oil will maintain required fluidity while ensuring that the chemicals added for PCB destruction do not vaporize.
- Effects of Oil Properties on the Process. It is likely that the water content of the oil will interfere with the chemical reaction of PCB destruction. Besides effects of interferences due to other compounds in the fuel oil such as sulfur may be present. All of these will be evaluated for providing necessary steps to eliminate the interferences.
- Reagent Mix. The reagent used for PCB destruction is a multicomponent blend of chemicals. In this phase of work, the proper mix and ratios of the reagents required to destroy PCB's in no. 6 oil will be defined.
- Modifications to Mobile Treatment Unit. The current unit is not designed for meeting all requirements of PCB destruction in no. 6 oil. The results of the studies on above outlined factors will be used to define and incorporate required modifications to the current unit to make it applicable for PCB destruction in no. 6 oil.

In parallel, the first phase will include detailing of permitting requirements and preparation of permit application documents.

In this alternate as in Alternate I, discussions of the chemical destruction option will be held with concerned local governmental officials and citizen groups. Issues relating to health effects, and environmental risk will be reviewed. A qualified independent and respected expert in public health sciences will be called upon to evaluate applicable issues and present his findings to agencies, individuals, and citizen's committee.

Phase II in this alternate would involve onsite trial/demonstration of the PCB destruction by chemical method using a mobile unit. The objective of the trial will be to demonstrate to all concerned the viability of the modified unit in successfully destroying the PCB's in residual no. 6 oil. All regulatory approvals and permits would be sought as a part of this phase.

Phase III would implement the onsite chemical destruction of PCB using the mobile unit. This would include all activities of setup, processing, teardown, and cleanup.

Table 2. Outline of Alternate II -- Chemical Destruction of PCB's

<u>Phase I Technical/Engineering Assessment</u>	
<u>Subtasks</u>	
<u>Process Development and Testing</u>	
<ul style="list-style-type: none">● Effect of process temperature● Effects of oil properties on the process● Reagent mix● System design and modification● Prepare permit documents	
<u>Information Dissemination to Citizens</u>	
<ul style="list-style-type: none">● Prepare presentation● Review by qualified expert● Presentation to concerned groups● Hire PR firm to provide information to the citizens	
Total estimated cost for Phase I	<u>\$50,000</u>
Estimated time for completion	3 months
<u>Phase II Onsite Trial/Demonstration and Permitting</u>	
<ul style="list-style-type: none">● Submit permit application● Review and provide permitting follow-up● Set up system for onsite demonstration● Perform days off demonstration● Complete all engineering, documentation, and associated items● Obtain all permits	
Total estimated cost for Phase II	<u>\$50,000</u>
Estimated time for completion	3 months

Table 2. Concluded

<u>Phase III Onsite Chemical Destruction of PCB</u>	
• Setup of system	
• Perform processing	
• Cleanup	
• System teardown	
• Complete reporting	
Total estimated cost for Phase III	\$2.00 per gallon of contaminated oil for a minimum of 100,000 gallons
Estimated time for completion	70 days
<u>Summary -- Alternate II -- Chemical Destruction</u>	
Total estimated cost	<u>\$100,000</u> (for Phase I and II) <u>Plus \$2.00 per gallon for Phase III</u>
Total estimated time for completion	8 months 10 days

Table 2 outlines the activities for each of the three phases of Alternate II, Chemical Destruction, and shows respective estimated costs and schedules associated with each phase.

All terms and conditions applicable to Acurex's proposal are to be agreed upon with City Light at the time of award. This proposal will remain in effect for a period of 60 days from the date of this letter.

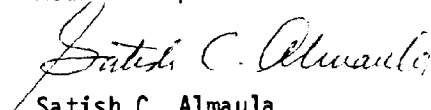
Technical questions should be directed to Mr. Satish Almaula at (415) 964-3200 extension 3617 or to Dr. Larry Waterland at extension 3618.

We at Acurex believe we have proposed the most simple, cost-effective, safe and proven solution to City Light's problem. We request the opportunity to discuss our proposal with City Light and concerned parties in the very near future. It is our opinion that this proposal, which is perhaps different from others that City Light may receive, stands on its merit of having been proven simple and of lowest risk. Further, the phased stepwise approach will ensure flexibility and control at each stage.

We appreciate the opportunity you have given us to submit this proposal and we look forward to working with you in the near future.

Sincerely,

Acurex Corporation



Satish C. Almaula
Manager, Technical Sales



R. L. Schroeder
Manager, Contracts and Procurement

SCA:RLS/wp